



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2019-0597; Project Identifier 2019-NE-05-AD; Amendment 39-21670; AD 2021-16-08]

RIN 2120-AA64

Airworthiness Directives; CFM International, S.A. Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is superseding Airworthiness Directive (AD) 2019-12-05 for certain CFM International S.A. (CFM) CFM56-5B, CFM56-5C, and CFM56-7B model turbofan engines with a certain rotating air high-pressure turbine (HPT) front seal. AD 2019-12-05 required replacement of the affected rotating air HPT front seal with a part eligible for installation. This AD was prompted by cracks found in the rotating air HPT front seal. This AD requires replacement of affected rotating air HPT front seals installed on CFM CFM56-5B, CFM56-5C, and CFM56-7B model turbofan engines that have fewer cycles since being reconfigured than the engines affected by AD 2019-12-05. This AD also requires CFM56-5B or CFM56-7B model turbofan engines with a reconfigured rotating air HPT front seal that was previously operated in a CFM56-5C model turbofan engine to follow the removal requirements for the CFM56-5C model turbofan engine.

The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: For service information identified in this final rule, contact CFM International, S.A., Aviation Operations Center, 1 Neumann Way, M/D Room 285, Cincinnati, OH 45125; phone: (877) 432-3272; email: fleetsupport@ge.com. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (781) 238-7759. It is also available at

<https://www.regulations.gov> by searching for and locating Docket No. FAA-2019-0597.

Examining the AD Docket

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2019-0597; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this final rule, any comments received, and other information. The address for Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

FOR FURTHER INFORMATION CONTACT: Christopher McGuire, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7120; fax: (781) 238-7199; email: Chris.McGuire@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 to supersede AD 2019-12-05, Amendment 39-19660 (84 FR 28717, June 20, 2019), (AD 2019-12-05). AD 2019-12-05 applied to all CFM CFM56-5B, CFM56-5C, and CFM56-7B model turbofan engines with a certain rotating air HPT front seal. AD 2019-12-05 required replacement of the affected rotating air HPT front seal with a part eligible for installation. The actions required by AD 2019-12-05 were interim and only addressed the highest risk engines with an affected rotating air HPT front seal that have a specified number of cycles since being reconfigured.

The NPRM published in the *Federal Register* on October 23, 2019 (84 FR 56709). AD 2019-12-05 was prompted by cracks found in the rotating air HPT front seal. In the NPRM, the FAA proposed to retain the requirements of AD 2019-12-05 and extend those requirements to engines that have fewer cycles since being reconfigured.

After the NPRM was issued, CFM revised its service information that provides instructions for replacing the affected rotating air HPT front seal. In addition, the revised service information addresses CFM56-5B or CFM56-7B model turbofan engines with a reconfigured rotating air HPT front seal that was previously operated in a CFM56-5C

model turbofan engine, and specifies that those engines follow the removal limits established for CFM56-5C model turbofan engines. In addition, the FAA determined changes to the proposed AD were necessary based on comments received on the NPRM.

Accordingly, the FAA issued a supplemental notice of proposed rulemaking (SNPRM), which published in the *Federal Register* on March 23, 2021 (86 FR 15436). In the SNPRM, the FAA proposed to retain the requirements of AD 2019-12-05 and expand the applicability to require the replacement of affected rotating air HPT front seals installed on CFM CFM56-5B, CFM56-5C, and CFM56-7B model turbofan engines that have fewer cycles since being reconfigured than the engines affected by AD 2019-12-05. In the SNPRM, the FAA also proposed to require that CFM56-5B and CFM56-7B model turbofan engines with a reconfigured rotating air HPT front seal that was previously operated in a CFM56-5C model turbofan engine follow the removal requirements of the CFM56-5C model turbofan engine. The FAA is issuing this AD to address the unsafe condition on these products.

Discussion of Final Airworthiness Directive

Comments

The FAA received comments from one commenter on the SNPRM. The commenter was The Boeing Company (Boeing). Boeing supported the proposed AD without change.

Conclusion

The FAA reviewed the relevant data, considered the comments received, and determined that air safety requires adopting the AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. This AD is adopted as proposed in the SNPRM.

Related Service Information

The FAA reviewed CFM Service Bulletin (SB) CFM56-5B S/B 72-1074, Revision 02, dated November 6, 2019; CFM SB CFM56-5C S/B 72-0794, Revision 02, dated November 6, 2019; and CFM SB CFM56-7B S/B 72-1042, Revision 02, dated November 6, 2019. CFM SB CFM56-5B S/B 72-1074, Revision 02, contains procedures

for replacing the affected rotating air HPT front seal on CFM CFM56-5B model turbofan engines. CFM SB CFM56-5C S/B 72-0794, Revision 02, contains procedures for replacing the affected rotating air HPT front seal on CFM CFM56-5C model turbofan engines. CFM SB CFM56-7B S/B 72-1042, Revision 02, contains procedures for replacing the affected rotating air HPT front seal on CFM CFM56-7B model turbofan engines.

Costs of Compliance

The FAA estimates that this AD affects 4 engines installed on airplanes of U.S. registry.

The FAA estimates the following costs to comply with this AD:

Estimated costs

Action	Labor Cost	Parts Cost	Cost per product	Cost on U.S. operators
Replace the rotating air HPT front seal	1 work-hour x \$85 per hour = \$85	\$344,600	\$344,685	\$1,378,740

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, Section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

The FAA has determined that this AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on

the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

(1) Is not a “significant regulatory action” under Executive Order 12866,

(2) Will not affect intrastate aviation in Alaska, and

(3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by:

a. Removing Airworthiness Directive 2019-12-05, Amendment 39-19660 (84 FR 28717, June 20, 2019); and

b. Adding the following new airworthiness directive:

2021-16-08 CFM International, S.A.: Amendment 39-21670; Docket No. FAA-2019-0597; Project Identifier 2019-NE-05-AD.

(a) Effective Date

This airworthiness directive (AD) is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

This AD replaces AD 2019-12-05, Amendment 39-19660 (84 FR 28717, June 20,

2019).

(c) Applicability

This AD applies to:

(1) CFM International, S.A. (CFM) CFM56-5B1, -5B2, -5B4, -5B5, -5B6, -5B7, -5B1/P, -5B2/P, -5B3/P, -5B4/P, -5B5/P, -5B6/P, -5B7/P, -5B8/P, -5B9/P, -5B3/P1, -5B4/P1, -5B1/2P, -5B2/2P, -5B3/2P, -5B4/2P, -5B6/2P, -5B9/2P, -5B3/2P1, -5B4/2P1, -7B20, -7B22, -7B24, -7B26, -7B27, -7B22/B1, -7B24/B1, -7B26/B1, -7B26/B2, -7B27/B1, -7B27/B3, -7B20/2, -7B22/2, -7B24/2, -7B26/2, -7B27/2, -7B27A model turbofan engines with a:

(i) Rotating air high-pressure turbine (HPT) front seal:

(A) With part number (P/N) 1795M36P01 or P/N 1795M36P02 and serial numbers (S/Ns) GWNDN949 through GWNSE969 or S/Ns GWN000CE through GWN0990L, not including S/Ns GWN08ND7, GWN0923A, GWN0971E, GWN098A1, GWN098W6, GWN098W8, GWN098WA, and GWN0990G, installed, and

(B) That has been removed from the original HPT disk and re-assembled to a different HPT disk.

(ii) [Reserved]

(2) CFM CFM56-5C2, -5C2/4, -5C2/F, -5C2/F4, -5C2/G, -5C2/G4, -5C2/P, -5C3/F, -5C3/F4, -5C3/G, -5C3/G4, -5C3/P, -5C4, -5C4/1, -5C4/P, -5C4/1P model turbofan engines with a:

(i) Rotating air HPT front seal:

(A) With P/N 1795M36P01 or P/N 1795M36P02 and S/Ns GWNDN949 through GWNSE969 or S/Ns GWN000CE through GWN0990L, not including S/Ns GWN08ND7, GWN0923A, GWN0971E, GWN098A1, GWN098W6, GWN098W8, GWN098WA, and GWN0990G, installed, and

(B) That has been removed from the original HPT disk and re-assembled to a

different HPT disk.

(ii) [Reserved]

(d) Subject

Joint Aircraft System Component (JASC) Code 7250, Turbine Section.

(e) Unsafe Condition

This AD was prompted by cracks found in the rotating air HPT front seal. The FAA is issuing this AD to prevent failure of the rotating air HPT front seal. The unsafe condition, if not addressed, could result in the uncontained release of the rotating air HPT front seal, damage to the engine, and damage to the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Required Actions

(1) For all affected CFM CFM56-5B and CFM56-7B model turbofan engines:

(i) If, on July 5, 2019 (the effective date of AD 2019-12-05), the rotating air HPT front seal has 7,000 cycles or greater since being reconfigured, remove the part from service within 50 cycles after July 5, 2019 (the effective date of AD 2019-12-05), or before further flight, whichever occurs later, and replace with a part eligible for installation.

(ii) If, on July 5, 2019 (the effective date of AD 2019-12-05), the rotating air HPT front seal has between 6,001 and 6,999 cycles, inclusive, since being reconfigured, remove the part from service within 500 cycles after July 5, 2019 (the effective date of AD 2019-12-05), but not to exceed 7,050 cycles since being reconfigured, or before further flight, whichever occurs later, and replace with a part eligible for installation.

(iii) For all remaining CFM56-5B and CFM56-7B model turbofan engines, remove the rotating air HPT front seal from service before accumulating 6,500 cycles since being reconfigured, or within 50 cycles after the effective date of this AD, whichever occurs later.

(2) For all affected CFM CFM56-5C model turbofan engines:

(i) If, on July 5, 2019 (the effective date of AD 2019-12-05), the rotating air HPT front seal has 4,250 cycles or greater since being reconfigured, remove the part from

service within 25 cycles after July 5, 2019 (the effective date of AD 2019-12-05), within 1,500 cycles since the last fluorescent penetrant inspection (FPI) of the rotating air HPT front seal, or before further flight after the effective date of this AD, whichever occurs later, and replace with a part eligible for installation.

(ii) If, on July 5, 2019 (the effective date of AD 2019-12-05), the rotating air HPT front seal has between 3,751 and 4,249 cycles, inclusive, since being reconfigured, remove the part from service within 250 cycles after July 5, 2019 (the effective date of AD 2019-12-05), before accumulating 4,275 cycles since being reconfigured, within 1,500 cycles since the last FPI of the rotating air HPT front seal, or before further flight after the effective date of this AD, whichever occurs later, and replace with a part eligible for installation.

(iii) For all remaining CFM CFM56-5C model turbofan engines, remove the rotating air HPT front seal from service before accumulating 4,000 cycles since being reconfigured, or within 50 cycles after the effective date of this AD, whichever occurs later.

(3) For CFM56-5B or CFM56-7B model turbofan engines with an affected rotating air HPT front seal that has been operated in a CFM56-5C model turbofan engine since being reconfigured, remove the rotating air HPT front seal from service using the cycle limits in paragraph (g)(2) of this AD.

(h) Definition

For the purpose of this AD, “reconfigured” occurs when a rotating air HPT front seal has been removed from the original HPT disk and re-assembled to a different HPT disk.

(i) Installation Prohibition

After the effective date of this AD, do not assemble any rotating air HPT front seal with greater than 0 cycles since new, having a S/N listed in paragraph (c) of this AD onto a HPT disk unless it is the same S/N HPT disk on which it has previously been assembled.

(j) Alternative Methods of Compliance (AMOCs)

(1) The Manager, ECO Branch, FAA, has the authority to approve AMOCs for

this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in Related Information. You may email your request to: *ANE-AD-AMOC@faa.gov*.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(k) Related Information

For more information about this AD, contact Christopher McGuire, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7120; fax: (781) 238-7199; email: *Chris.McGuire@faa.gov*.

(l) Material Incorporated by Reference

None.

Issued on July 29, 2021.

Lance T. Gant, Director,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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